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List of Abbreviations

AIDS .....Autoimmune deficiency syndrome

APACHE .....Acute Physiologic and Chronic Health Evaluation

APS.....Acute Physiology Score

CCS .....Clinical Classification System

CENTRAL .....The Cochrane Central Register of Controlled Trials

CRD database.....Centre for Reviews and Dissemination Databases

DARE.....The Database of Abstracts of Reviews of Effects

EBM.....Evidence Based Medicine

GCS .....Glasgow Coma Scale

HTA .....Health Technology Assessment Database

ICNARC .....Intensive Care National Audit and Research Centre

ICU .....intensive care unit

ISS.....Injury Severity Score

LODS .....Logistic Organ Dysfunction Score

LOS.....Length of Stay

MODS .....Multiple Organ Dysfunction Score

MPM .....Mortality Prediction Model

MPM .....Mortality Prediction Model

NHS EED .....NHS Economic Evaluation Database

PICO .....Patient or problem, Intervention, Comparison, Outcome

PICU .....Paediatric Intensive Care Unit

PIM .....Pediatric Index of Mortality

List of Abbreviations

PRISM .....Pediatric Risk of Mortality

PSI.....Physiologic Stability Index

PSI.....Physiologic Stability Index

PTS.....Pediatric Trauma Score

RCR.....Randomized Controlled research

ROC.....receiver operating characteristic

RTC .....Randomized Controlled Trials

SAPS.....Simplified Acute Physiologic Score

SOFA .....Sequential Organ Failure Assessment

TISS.....Therapeutic Intervention Scoring System

UK .....United Kingdom

USA .....United States of America

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Abstract

Introduction: Monitoring of an acutely ill child is done by collecting physiological data with the help of invasive and non-invasive procedures. Monitoring requirements are divided into hemodynamic, pulmonary, and neurologic monitoring which in turn could be invasive or non-invasive. **Aim of the Work:** The aim of this study is to review the literature about the most recent evidence based medicine on the commonly used scores of acute illness in pediatrics in order to increase awareness on using them in the routine care of these acutely ill patients. **Summary:** Evidence based medicine (EBM) is conscious, specific, reasonable use of modern, best evidences in making decisions about treatment of individual patients. Its real purpose is that by the use of the best possible evidence doctor chooses for his patient the best possible solution, wanting to provide to him the optimum health care in every aspect. It is also used to avoid major mistakes in the course of treatment, and by this raises the quality of provided health care to the patient. In a wider context, it can save the lives of our patients.

Keywords: Based Medicine, Pediatric Illness, Scoring Systems

INTRODUCTION & RATIONALE

Monitoring of an acutely ill child is done by collecting physiological data with the help of invasive and non-invasive procedures. Monitoring requirements are divided into hemodynamic, pulmonary, and neurologic monitoring which in turn could be invasive or non-invasive. Scoring systems are useful for making triage decisions and assessing the performance of an intensive care unit. Stabilization of a critical ill child includes restoration of physiological status of the cardiovascular, respiratory, central nervous and renal systems and also nutritional support ***(Kini, 2009).***

Critically ill children are characterized by large variations in the normal body homeostasis. These variations can be estimated by the drift of the physiological variables from the normal range. Scores can be constructed from deviations of these drifted variables. Broadly, these scores can be divided into two categories. The first category belongs to the prognostic scores which predict the risk of death at the time of entry into Intensive Care Unit (ICU). The other category is of the descriptive or outcome scores which describe the course of illness after the admission into the ICU. The scoring systems provide objective measures for inter- and intra-unit comparisons with time and also provide useful information for comparing the severity of illness of patients, at the time of enrollment into clinical trials ***(Gulla and Sachdev, 2016).***

The various scoring systems used in the pediatric intensive care unit are categorized as Organ specific scores like Glasgow Coma Scale (GCS) and croup score; Scores based on mechanism of injury like Pediatric Trauma Score (PTS) and Injury Severity Score (ISS) and lastly other Pediatric scoring systems as Pediatric Index of Mortality (PIM), Physiologic Stability Index (PSI) and Pediatric Risk of Mortality (PRISM) ***(Grinkeviciūte et al., 2007).***

In this review, we tried to focus on the various scoring system available for predicting mortality risk in pediatric critical care setting, their present, past and future and their uses in ICU management and administration.

Aim of the Study

The aim of this study is to review the literature about the most recent evidence based medicine on the commonly used scores of acute illness in pediatrics in order to increase awareness on using them in the routine care of these acutely ill patients.

Chapter (I):
Overview of Evidence based Medicine

Definition:

Evidence Based Medicine (EBM) is the conscientious, and reasonable use of modern, best evidence in making decisions about the care of individual patients, integrating clinical experience and patient values with the best available research information, aiming to increase the use of high quality clinical research in clinical decision making. EBM requires new skills of the clinician, including efficient literature-searching, and the application of formal rules of evidence in evaluating the clinical literature ***(Masic et al., 2008).***

EBM application means relating individual clinical signs, individual clinical experience with the best scientific evidences obtained by the clinical research ***(Sackett et al., 2000).***

The revised and improved definition of evidence-based medicine is a systematic approach to clinical problem solving to allow the integration of the best available research evidence with clinical expertise and patient values. Under the individual clinical noticing we thought of the ability, skill that doctors acquired during years of clinical practice,

and clinical experience is necessary and indispensable part that makes a good doctor. The best scientific evidence is considered to be a randomized controlled clinical study conducted on the amount of respondents that can prove the effectiveness of many drugs, as well as the harm and the inefficacy of others in comparison with the best existing therapy ***(Sackett et al., 1996).***

Evidence-based medicine into the field of practice:

The practice of evidence-based medicine is a process of lifelong, self-directed, problem-based learning in which caring for one's own patients creates the need for clinically important information about diagnosis, prognosis, therapy and other clinical and health care issues. One of the greatest achievements of evidence-based medicine has been the development of systematic reviews and meta-analyses, methods by which researchers identify multiple studies on a topic, separate the best ones and then critically analyze them to come up with a summary of the best available evidence ***(Masic et al., 2008).***

Categories of Evidence-based medicine:

Evidence-based medicine categorizes different types of clinical evidence and ranks them according to the strength of their freedom from the various biases that beset medical research ***(British Medical Association, 1995):***

I.

a) Evidences obtained by meta-analysis of several Randomized Controlled research (RCR).

b) Evidences from only one RCR.

II.

a) Evidences from well-designed controlled research RCR.

b) Evidences from one quasi experimental research.

III. Evidences from non-experimental studies (comparative research, case study), according to some, for example Textbooks.

IV. Evidences from experts and clinical practice.

The EBM focus on three tasks: a) to use evidence summaries in clinical practice; b) to help develop and update selected systematic reviews or evidence-based guidelines in their area of expertise; and c) to enrol patients in studies of treatment, diagnosis and prognosis on which medical practice is based. New in the application of EBM is that making decisions about treatment for each individual patient is a complex process that allows doctors and patients to select the best possible solutions for each individual patient. As the EBM includes the routine use of

the best scientific evidences obtained by clinical research, they are actually impossible before electronic databases in the early 90's occurred ***(Masic et al., 2008).***

Basic elements of evidence-based medicine and five steps to apply evidence based approach in the daily practice:

The basic elements of evidence-based medicine include asking clinical questions that can be answered by research, finding the best available evidence, judging whether the evidence is accurate and applicable to your patients, and applying this evidence in practice ***(Sackett et al., 2000).***

I. Problem definition:

A clinician starts the search for the best and newest data needed to solve individual patient's problem by formulating an answerable clinical question, which must be clear, directly focused on the problem, and answerable by searching the medical literature:

a. PICO format

A good clinical question should have four essential components structured in the PICO format (Patient or problem, Intervention, Comparison, Outcome) as follows **(Table 1.1):**

Table (1.1): Essential components structured in the PICO format for good clinical question ***(Masic et al., 2008):***

i.	The patient or problem-who are the relevant patients, what kind of problem we try to solve?
ii.	The intervention-what is the management strategy, diagnostic test or exposure (drugs, diagnostic test, foods or surgical procedure)?
iii.	Comparison of interventions-what is the control or alternative management strategy, test or exposure that we will compare?
iv.	The outcome-what are the patient-relevant consequences of the exposure in which we are interested?

b. Type of clinical question

The most common type of clinical question is about how to treat a disease or condition. Such questions are questions about intervention. Types of clinical questions as follows **(Table 1.2):**

Table (1.2): Types of good clinical questions ***(Masic et al., 2008):***

i.	Questions about intervention
ii.	Questions about etiology and risk factors
iii.	Questions about frequency and rate
iv.	Questions about diagnosis
v.	Questions about prognosis and prediction
vi.	Question about cost-effectiveness
vii.	Question about phenomena

II. Search for wanted sources of information:

The ideal information source is valid (contains high quality data), relevant (clinically applicable), comprehensive (has data on all benefits and harms of all possible interventions), and is user-friendly (is quick and easy to access and use).

III. Critical evaluation of the information:

Critical assessment of is a process that involves careful reading and analysis of methodology, contents and conclusions. A key question that should be kept in mind is "Do I believe in the results enough that I'll be ready to a similar approach, or in achievement of similar results with my patients?" Skills to obtain the ability of critical evaluation should be learned and practiced as any other clinical skills ***(Masic et al., 2008).***

IV. Application of information of the patient:

The decision how to apply acquired information on the special circumstances pertaining to each patient and is the most complex. The questions that we should ask before the decision to apply the results of the study are ***(Sackett et al., 2000):***

a. Are the participants in the study similar enough to my patient?